FEDERAL - STATE COOPERATIVE

SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for

Rio Grande Drainage Basin

By

Division of Irrigation, Soil Conservation Service
United States Department of Agriculture
and
Colorado Agricultural Experiment Station

Data included in this report were obtained by the agencies named above in cooperation with the U. S. Forest Service, National Park Service, State Engineers of Colorado, Wyoming and New Mexico and other Federal, State and local organizations.

As of

FEB. 1, 1951

FEDERAL-STATE COOPERATIVE
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WATER SUPPLY FORECASTS

FOR

RIO GRANDE BASIN

Report Prepared

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WATER SUPPLY OUTLOOK
RIO GRANDE AND CANADIAN DRAINAGE BASINS
February 1, 1951

The water supply outlook for the Rio Grande and its tributaries is not favorable as of February 1. After the general storm in late January the snow cover on the headwaters of the Rio Grande in San Luis Valley was 60 to 70 percent of normal. Along the Sangre de Cristo range to the east of the valley the snow accumulation to date was about 50 percent of average. In Northern New Mexico the snow cover is very low, probably the minimum for February 1 since snow measurements were started in 1937. Soil moisture conditions are described as dry throughout the entire Rio Grande Valley. Precipitation has been generally sub-normal through the winter months.

RIO GRANDE

Snow accumulation along the Continental Divide range west of San Luis Valley is 60 to 70 percent of normal. About one-half of the present snow pack is a result of snowfall during the last four days of January. The snow on the Sangre de Cristo is about 50 percent of normal. There is one to six inches of new snow on the valley floor. The soil moisture is dry due to sub-normal precipitation for several months. Storage in irrigation reservoirs is about 15 percent of February 1, 1950 and much less than the past ten year average.

Ha!

On the headwaters of the Rio Chama the snow cover is 50 percent of normal and slightly over half of February 1 a year ago. Elsewhere in Northern New Mexico there was practically no snow till the end of January. After this recent storm it is believed that the current snow is less than for any year since snow measurements were started in 1937. Soil moisture conditions are generally dry in the Middle Rio Grande Area. Storage in El Vado Reservoir is now 31,000 acre-feet as compared to 164,000 a year ago.

The combined storage in Elephant Butte and Caballo Reservoir is now 427,000 acre-feet, about one-half of the water stored as of February 1, 1950. Precipitation in the lower valley has been deficient and soil moisture conditions are extremely dry.

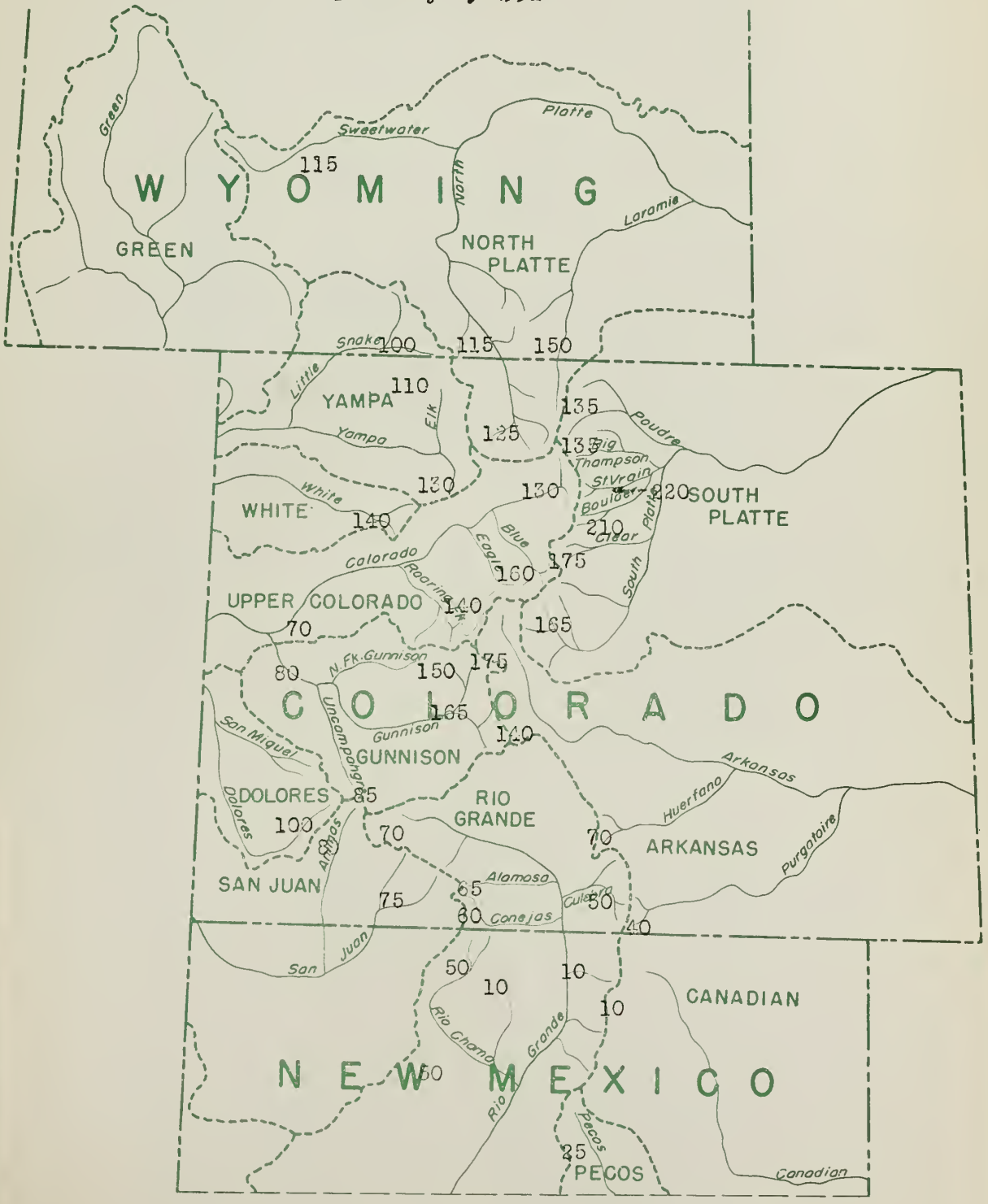
On the headwaters of the Pecos River near Santa Fe the snow water content is 25 percent of normal. Storage in Alamogordo, McMillan and Avalon Reservoirs is 112,000 acre-feet, slightly less than last year but well above average. Precipitation has been sub-normal and extremely dry soil moisture conditions are reported for the Carlsbad Project.

CANADIAN DRAINAGE

There is very little snow on Canadian River tributaries. Soil moisture conditions are reported as fair in the Tucumcari area. Storage in Conchas Reservoir is now 195,000 acre-feet. A year ago there was 225,000 in storage.

WATER CONTENT OF SNOW ON THE WATERSHEDS OF PLATTE, ARKANSAS, UPPER COLORADO AND RIO GRANDE BASINS BASED ON SNOW SURVEYS MADE APPROXIMATELY FIRST DAY OF MONTH

In Percent of Normal
February 1, 1951



SNOW SURVEYS AND IRRIGATION WATER FORECASTS
RIO GRANDE BASIN

STATUS OF RESERVOIR STORAGE, February 1, 1951

STREAM	RESERVOIR	USABLE CAPACITY	THOUSANDS OF ACRE FEET IN STORAGE				
			About February 1				10-year Ave.
		1000 A.F.	1951	1950	1949	1948	1941-1950
RIO GRANDE	Rio Grande	45.8	2.8	29.1	16.6	20.7	16.3
	Santa Maria	45.0	2.2	22.9	17.1	4.8	11.1
	Sanchez	103.0	2.8	12.3	4.8	8.7	13.8
	Terrace	17.7	1.3	3.7	1.5	5.6	3.2
	Continental	26.7	2.8	17.3	5.2	2.6	9.1
	Elephant Butte	2273.7	309.8	607.6	496.3	436.0	981.4
	Caballo	365.0	117.9	240.2	130.5	88.1	224.2
CHAMA RIVER	El Vado	226.0	31.0	163.8	147.0	6.0	73.4
CANADIAN RIVER	Conchas	600.0	195.1	225.1	307.0	348.0	305.1
PECOS RIVER	Alamogordo	148.0	103.0	104.0	25.0	26.2	58.1
	McMillan--Avalon	45.0	9.4	25.3	0.0	6.2	15.0

*Some for shorter periods

SNOW SURVEYS AND IRRIGATION WATER FORECASTS
for
RIO GRANDE BASIN
February 1, 1951

SUMMARY OF FEBRUARY 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS YEARS BY WATERSHEDS

WATERSHEDS	Snow Depth			Water Content			Number Courses in Average	Snow Density			1951 Water Content in percent of	
	Twelve year Avg.*	1950	1951	Twelve year Avg.*	1950	1951		Twelve year Avg.*	1950	1951	Twelve year Avg.*	1950
	In.	In.	In.	In.	In.	In.		Percent	Percent	Percent		
Rio Grande (Colo.)	28.4	32.5	25.5	6.9	7.8	4.3	9	24	24	17	62	55
Upper Rio Grande	34.2	47.7	32.6	8.4	11.5	5.9	2	25	24	18	70	51
Alamosa River	22.6	30.5	17.9	4.0	5.6	1.9	1	18	18	11	48	34
Conejos River	35.6	38.4	36.7	9.9	9.7	6.2	2	28	25	17	63	64
Culebra River	26.9	26.6	20.0	6.5	6.8	3.1	1	24	26	16	48	46
Rio Grande(N.M.)	21.8	19.9	9.3	5.0	4.0	1.7	12	23	20	18	34	42
Chama River	30.7	27.1	21.1	8.0	6.7	4.0	4	26	25	19	50	60
Pecos River	18.3	15.0	5.8	3.9	3.3	0.4	4	21	20	18	27	32
Canadian River	22.5	21.8	9.6	5.0	3.7	1.2	3	22	19	13	24	37

*Some for shorter periods

PRECIPITATION DATA

WATERSHED	STATE	Precipitation October 1 to January 31	Departure from Normal	Precipitation January	Departure from Normal
		Inches	Inches	Inches	Inches
Canadian	New Mexico	0.96	-1.66	0.75	+0.34
Rio Grande	Colorado	2.94	-2.58	1.04	+0.38
Rio Grande (N)	New Mexico	1.45	-1.84	1.07	+0.27
Rio Grande (S)	New Mexico	0.88	-1.60	0.32	-0.01
Pecos	New Mexico	1.28	-1.64	0.20	-0.32

*Average of Selected High Elevation Stations

RIO GRANDE DRAINAGE SNOW SURVEYS
February 1, 1951

Drainage Basin and Snow Course	Location					Date of Survey	Snow Depth (Inches)	Snow Cover Measurements				
								Water Content (Inches)			Past Record	
	No. and State	Sec.	Twp.	Range	Elev.			1951	1950	1949	Yrs. of Rec.	Av. Water Content (Inches)
RIO GRANDE IN COLORADO												
Wolf Creek Pass	26 Colo.	4	37N	2E	10000	2/1	66.7	13.1	24.0	27.2	11	16.3
Upper Rio Grande	27 "	13	40N	4W	9350	2/6	19.0	3.4	6.4	10.4	11	4.9
Silver Lakes	47 "	15	36N	5E	9600	2/1	17.9	1.9	5.6	8.3	11	4.0
River Springs	49 "	25	33N	6E	9300	1/31	22.9	2.6	7.4	8.5	10	5.2
LaVeta Pass #2	74 "	22	28S	70W	9300	2/2	21.0	3.5	3.4	6.8	11	4.9
Cumbres Pass #2	77 "	17	32N	5E	10000	2/1	50.4	9.7	12.0	21.7	12	14.6
Santa Maria	80 "	8	31N	2W	9700	2/1	11.9	1.3	4.2	7.3	12	4.0
Culebra	82 "		37.2N	105.2W	10000	2/1	20.0	3.1	6.8	7.4	11	6.5
Ft. Garland	84 "	13	29N	72W	8200	1/28	0.0	0.0	0.0	2.3	10	1.7
La Manga	110 "	24	32N	5E	10100	1/30	51.2	8.1	16.7	21.1	2	
Cochetopa Pass	126 "	12	45N	3E	10000	1/31	18.1	2.8	1.5	5.0	2	
Howardville	151	15	41N	7W	9800	1/31	33.7	6.4	--	--	0	
Red Mt. Pass	153	13	42N	8W	11000	1/31	68.5	17.3	--	--	0	
Wolf Creek Summit	155	6	37N	2E	11000	2/1	62.4	12.1	--	--	0	
		Average for drainage					26.2	4.3	7.8	11.1		6.9
UPPER RIO GRANDE												
Wolf Creek Pass	26 Colo.	4	37N	2E	10000	2/1	66.7	13.1	24.0	27.2	11	16.3
Upper Rio Grande	27 "	13	40N	4W	9350	2/6	19.0	3.4	6.4	10.4	11	4.9
Santa Maria	80 "	8	41N	2E	9700	2/1	11.9	1.3	4.2	7.3	12	4.0
		Average for drainage					32.5	5.9	11.5	15.0		8.4

RIO GRANDE DRAINAGE SNOW SURVEYS
February 1, 1951

Drainage Basin and Snow Course	Location No. and State	Sec.	Twp.	Range	Elev.	Date of Survey	Snow Depth (Inches)	Snow Cover Measurements: Water Content (Inches) 1951	1950	1949	Past Record: Yrs. of Rec.	Past Record: Av. Water Content (Inches)
ALAMOSA RIVER												
Silver Lakes	47 Colo.	15	36N	5E	9600	2/1	17.9	1.9	5.6	8.3	11	4.0
CONEJOS RIVER												
River Springs	49 Colo.	25	33N	6E	9300	1/31	22.9	2.6	7.4	8.5	10	5.2
Cumbres Pass #2	77 "	17	32N	5E	10000	2/1	60.4	9.7	12.0	21.7	12	14.6
La Manga	110 "	24	32N	5E	10100	1/30	51.2	8.1	16.7	21.1	2	18.9
			Average for drainage				36.7	6.2	9.7	15.1		9.9
CULEBRA RIVER												
Culebra	82 Colo.		37.2N	105.2W	10000	2/1	20.0	3.1	6.8	7.4	11	6.5
					RIO GRANDE IN NEW MEXICO							
CHAMA RIVER												
Cumbres Pass #2	77 Colo.	17	32N	5E	10000	2/1	50.4	9.7	12.0	21.7	12	14.6
Pay Role	15 N.Mex.	16	28N	7E	9700	1/29	3.1	0.2	6.7	12.4	10	6.9
Chama Divide	17 "		36.9N	106.7W	7750	2/1	15.4	2.4	3.3	6.7	11	4.2
Chamita	18 "		36.9N	106.7W	8500	1/29	15.5	3.5	4.5	10.0	9	6.2
Bateman	29	5	26N	6E	9300	1/31	12.3	2.4	4.6	--	1	
			Average for drainage				21.1	4.0	6.7	12.7		8.0
PECOS RIVER												
Aspen Grove*	4 N.M.	8	28N	15E	9500	1/28	1.7	0.0	3.0	3.0	12	4.2
Panchuela	20 "	25	24N	16E	9200	1/31	14.7	0.9	2.0	4.1	12	3.2
Big Tesuque*	12 "	23	22N	13E	9000	1/28	1.0	0.2	4.4	5.9	9	4.4
Gallinas	25 "	22	22N	13E	10100	1/28	0.0	0.0	0.0	5.4	3	2.7
			Average for drainage				5.8	0.4	3.3	4.5		3.9

*On adjacent drainage

RIO GRANDE DRAINAGE SNOW SURVEYS
February 1, 1951

Drainage Basin and Snow Course	Location					Snow Cover Measurements						
	No. and State	Sec.	Twp.	Range	Elev.	Date of Survey	Snow Depth (Inches)	Water Content (Inches) 1951	1950	1949	Past Record Yr. of Rec.	Past Record Av. Water Content (Inches)
						RIO GRANDE IN NEW MEXICO						
Red River	1 N.M.	29	28N	15E	9500	1/29	4.2	0.7	5.7	6.9	11	5.3
Taos Canyon	2 "	10	25N	15E	9000	1/29	0.4	0.1	3.5	3.6	12	5.3
Aspen Grove	4 "	12	18N	10E	9100	1/28	0.0	0.0	3.6	3.0	12	4.2
Lee Ranch	5 "	3	18N	4E	9050	2/1	10.0	2.3	3.0	6.8	12	5.1
Hematite Park*	9 "	8	28N	15E	9500	1/29	0.0	0.0	3.4	4.2	10	3.7
Tres Ritos	12 "	23	22N	13E	9000	1/31	10.2	2.3	2.7	3.4	12	4.4
Pay Role	15 "	16	28N	7E	9700	1/29	3.1	0.2	6.7	12.4	10	6.9
Chama Divide	17 "		36.9N	106.7W	7750	2/1	15.4	2.4	3.3	6.7	11	4.2
Chamita	18 "		36.9N	106.7W	8500	2/1	15.5	3.5	4.6	10.0	9	6.2
Cordova	19 "	22	22N	13E	10100	2/1	18.6	4.4	5.1	9.3	9	6.8
Panchuela #2	20 "	27	19N	12E	8300	2/1	14.7	0.9	2.0	4.1	12	3.2
Big Tesqque	21 "	17	18N	11E	10000	1/28	1.0	0.2	4.4	5.9	9	4.4
Elk Cabin	24 "	8	18N	11E	8250	2/1	6.8	0.5	2.3	3.2	3	3.2
Rio En Medio	26 "	8	18N	11E	10400	1/28	3.6	0.3	4.9	0.0	1	2.5
Quemazon	28 "	34	20N	5E	9500	2/2	17.7	2.2	4.8	--	1	4.8
Bateman	29 "	5	26N	6E	9300	1/31	12.3	2.4	7.6	--	1	7.6
Costilla	30 "	-	37.0N	105.5	10000	2/1						
		Average for drainage					9.3	1.7	4.0	6.4		5.0
						CANADIAN RIVER						
Hematite Park	9 N.M.	8	28N	15E	9500	1/29	0.0	0.0	3.4	4.2	10	3.7
Ocate Mesa	10 "	25	24N	16E	9200				3.0	1.9	10	2.4
Tres Ritos*	12 "	23	22N	13E	9000	1/31	10.2	2.3	2.7	3.4	12	4.4
Cordova*	19 "	22	22N	13E	10100	2/1	18.6	4.4	5.1	9.3	9	6.8
		Average for drainage					9.6	2.2	3.7	5.6		5.0

*On adjacent drainage

Federal - State - Private

COOPERATIVE SNOW SURVEYS

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Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"WATER IS THE WEST'S GREATEST RESOURCE"